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Welcome from the chairs

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Welcome from the Chairs

Welcome to the third edition of the workshop on Machine Learning Techniques for Software Quality Evaluation (MaLTeSQuE 2019) to be held in Tallinn, Estonia, August 27th, 2019, co-located with ESEC/FSE 2019.

The assessment of software quality is one of the most multifaceted (e.g., structural quality, product quality, process quality, etc.) and subjective aspects of software engineering (since in many cases it is substantially based on expert judgment). Such assessments can be performed at almost all phases of software development (from project inception to maintenance) and at different levels of granularity (from source code to architecture). However, human judgment is: (a) inherently biased by implicit, subjective criteria applied in the evaluation process, and (b) its economical effectiveness is limited compared to automated or semi-automated approaches. To this end, researchers are still looking for new, more effective methods of assessing various qualitative characteristics of software systems and the related processes.

In the recent years, we observed a rising interest in adopting various approaches to exploit machine learning (ML) and automated decision-making processes in several areas of software engineering. These models and algorithms help to alleviate human subjectivity in order to make informed decisions based on available data and evaluated with objective criteria. Thus, the adoption of ML techniques is a promising way to improve software quality evaluation. Conversely, learning capabilities are increasingly embedded within software, including in critical domains such as automotive and health. This calls for the application of quality assurance techniques to ensure the reliable engineering of ML-based software systems.

The aim of MaLTeSQuE is to provide a forum for researchers and practitioners to present and discuss new ideas, trends and results concerning the application of ML methods to software quality evaluation and the application of software engineering techniques to self-learning systems. We expect that the workshop will help in (1) validating existing ML methods for software quality evaluation as well as their application to novel contexts, (2) evaluating the effectiveness of ML methods, both compared to other automated approaches and the human judgment, (3) adapting ML approaches being already used in other areas of science in the

context of software quality, (4) designing new techniques to validate ML-based software, inspired by traditional software engineering techniques.

This year, MaLTesQuE received ten submissions from eleven countries including China, Russia and Bangladesh. Seven papers were accepted after a thorough review process. At least three members of the program committee reviewed each submission. The accepted papers cover various topics and are divided into three main sessions: *Testing and Debugging* in which Nair *et al.* use mutation and machine learning to predict metamorphic relations, and Borg *et al.* provide an open implementation of the SZZ algorithm for just-in-time bug prediction; *On the Role of Data* in which Foidl *et al.* offer a risk-based approach for features supported by insufficient data and Pecorelli *et al.* discusses the role of data balancing for ML-based code smell detection; finally, in the session *Quality Attributes*, Rahman *et al.* classify non-functional requirements using recurrent neural networks, Viuginov *et al.* apply ML to fold automatically less interesting regions of the code in editors, and Lenarduzzi *et al.* use ML to improve technical debt estimation.

Finally, we sincerely thank the program committee members, authors, and participants who make MaLTesQuE 2019 an exciting and successful event!

Francesca, Gilles, Apostolos, Mathieu, Bartosz, Maxime, Fabio and Xavier
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